The Veterinary Record.

(*Founded by William Hunting F.R.C.V.S., 1888.*)

No. 39 SEPTEMBER 25, 1926. Vol. 6

Pyorrhœa in the Dog and Cat.

Discussion on Mr. Henry Gray's Dublin Congress Paper.

The concluding Congress discussion was upon Mr. Henry Gray's paper, "Pyorrhœa in the Dog and Cat," and was opened by Professor J. J. O'Connor, of the Royal Veterinary College of Ireland, in the following terms:—

The Provisional Committee decided that it would be very desirable to have a paper dealing with some disease of the small animals from a well-known authority on the subject like Mr. Henry Gray and consequently asked him to provide one, leaving the title of the paper to his own choice. He kindly complied with our request and I congratulate him on having chosen to deal with pyorrhœa in the dog and cat, as there is very little veterinary literature on this disease, which is so prevalent nowadays. A very instructive work on pyorrhœa in the human subject has just been issued by Dr. Stanley Colyer, of London, entitled "Chronic Infection of the Jaws." He considers this title more suitable for the disease than that of "pyorrhœa" because in every established case of the affection a chronic osteomyelitis of the jaws is present. He has proved this to be the case by a long series of radiograms taken from the human subject. Even in cases where the clinical symptoms of the disease were slight he was able to demonstrate ostitis of the jaws by the shadows on the radiogram. He has shown that the lesion is not merely an inflammation of the lining of the alveolus, but that the structures more or less involved comprise the periodontal membrane, the lamina dura or thin layer of compact bone beneath the membrane and the cancellated bony tissue.

In 90 per cent. of cases the condition starts as a marginal gingivitis, whence it spreads *via* the periodontal membrane and lamina dura to the cancellated tissue, which it affects to a varying degree. Dr. Colyer's experience has led him to the conclusion that most people over twenty years of age suffer from pyorrhœa with harmful results, in every case due to the toxæmia which it produces. The toxæmia varies in intensity and the manner in which it is manifested in different cases. The symptoms produced may be those of debility, neurasthenia or psychoneurosis. Eighty-five per cent. of cases of oral sepsis are associated with lassitude and most cases of "off colour" and indifferent health may be ascribed to chronic jaw disease. The proof of the truth revealed by radiography is the improvement which ensues when treatment is adopted for pyorrhœa in cases where it was diagnosed by this means. The changes in the shadows on the films depend on rarefaction and sclerosis of the bone caused by infection, the sclerosis being evidence of resistance on the part of the osseous tissue. When the infection is intense rarefaction predominates.

The sclerosed part may give way to new infection, breaking down rapidly and completely and allowing the infection to spread.

Infection may also enter through the apical foramen of the tooth from the pulp.

When the teeth are loose, or dull on percussion, destructive changes are revealed by radiography. Bluish, swollen gums with dilated venules are very suggestive of general infection of the jaws and constitute a very serious condition in children. Radiography may reveal severe deep infection while there is little or no clinical evidence of the disease. On the other hand, local evidence may be marked while that shown by radiography is slight—the former being the case in young and the latter in old subjects.

As regards the cause of the disease, it is predisposed to by anything which weakens the general resistance of the organism. Locally it may be the result of oral breathing, leading to a dry mouth and the consequent deposit of débris on the teeth. Enlarged tonsils and adenoids may thus predispose to it. Forcible regulation of irregular teeth in children, disturbing the dental roots, has been found to be a fruitful cause of the disease. The path of infection from the jaws into the system may be (1) the alimentary tract, (2) the lymph or blood stream, or (3) directly through the bone.

The lymph or blood stream is the most important mode of infection. Micro-organisms may enter the circulation from the jaw and be excreted in the intestines, setting up, perhaps, enteritis.

The foregoing is in accordance with what Mr. Gray has described as occurring in the dog and cat. I quite agree with Mr. Gray as to the predisposing causes of the disease, *viz.*, the irrational method of feeding whereby dogs do not require to use their teeth for the tearing or crushing of food, thus allowing a deposit to form thereon from the fluids of the mouth, harbouring micro-organisms which eventually, by virtue of their toxins, bring about the disease as described. The calcareous deposit on the teeth in the form of tartar mechanically separates them from the gum, allowing the entrance of food material into the alveolus, where it decomposes and maintains sepsis, which spreads deeply into the surrounding bone.

Artificial life favours the condition in all animals. It is more common in town that in country dogs. Sheep dogs have usually beautifully white teeth, whereas the ladies' pet has frequently yellow, pasty teeth—a condition which is often the precursor of pyorrhœa.

In-breeding favours the disease. I think that the Borzoi is particularly liable to it. Mr. Gray's experiments with Pomeranian pups were very interesting

and instructive. The picture which he paints of the pet house-dog affected with pyorrhœa is typical and is quite in accordance with my experience. The diagnosis of the disease is easy when it is well-established, but in its incipient stages it is difficult to give a definite opinion about a case. Many of the obscure cases of indifferent health in dogs, which we have been in the habit of ascribing to alimentary trouble, may be due to pyorrhœa without obvious local symptoms.

The public health point of view is important, for the house-dog whose mouth is a cesspool of micro-organisms is undoubtedly a menace to the health of the household. It is surprising, as Mr. Gray remarks, that people who should be possessed of ordinary intelligence allow their pets to become affected with putrid mouths without seeking any remedy for the condition.

I agree with him that persons who dose their dogs with patent medicines, without any knowledge of their action or the conditions for which they administer them, are worse than vivisectionists and deserve the attention of the Society for the Prevention of Cruelty to Animals. Prevention and treatment of the disease require no comment and are amply dealt with by Mr. Gray. I will conclude by thanking Mr. Gray for providing the Congress with such an important and able paper. (Applause.)

Captain HAMILTON KIRK (London) sent the following contribution, which was read :—

Owing to annual military training coinciding with the date of Congress, I am unfortunately unable to be present at the meeting on 30th July ; but having read Mr. Gray's thesis upon pyorrhœa, I would like to be permitted to make a few observations thereon.

From clinical experience, I am able to endorse practically all the points upon which Mr. Gray lays particular emphasis. There are some aspects of the question, however, which appear to need amplification, especially such as concern the etiology. Gray's most dogmatic assertion, one which he has reiterated throughout his paper, is to the effect that pyorrhœa owes its origin entirely to feeding on minced, soaked, or other soft food. He gives no other factor as even likely to cause the condition. Yet I fancy that there may be several other factors.

For instance, the ulcerated gums which arise as a direct complication of distemper afford an easy entrance, for any harmful germ, to an already debilitated tissue. Again, it is well known that in indigestion, gastric derangements, or other alimentary disturbance, there is a deposit of salts thrown down in the mouth which collects about the teeth in the form of tartar. Pyorrhœa is not the cause of tartar, but is the result of it, and if from some such source a dog acquires a badly-tartared mouth, followed by receding gums, it is not improbable that this will at some near or distant date result in pyorrhœa.

Further, if we are going dogmatically to assert that no other condition underlies the incidence of pyorrhœa than the non-use of the teeth, how are we to reconcile such a statement with the onset of pyorrhœa in man ? All human beings in this country eat the same kind of food, of the same consistence, and yet some individuals develop pyorrhœa whilst others do not. I have known people with pyorrhœa to have quite clean and well-cared-for teeth—people whom one would never suspect as subjects of such a disease. They have masticated their food in the same way as others and yet become infected. Could not the reason well be that in such cases auto-intoxication plays a part ?

A great number of human beings, no less than animals, are sufferers from auto-intoxication of more or less severity, arising from chronic constipation. We know that poisons in the blood (as exemplified by mercury) are capable of loosening or decaying the teeth, so why not the toxin developed within the body? It is a question, too, whether hormone deficiency of one or other of the glands is not a predisposing factor. In this connection I have in mind particularly the pineal and pituitary glands.

I have no doubt that a large number of cases of pyorrhœa in dogs arises through improper feeding, yet I have known sufferers from the disease, although wrongly fed on soft foods, to be habitual players with rubber bones and hard rubber balls which they bite and gnaw all the time. I think in many cases it is not so much that people refuse to feed their dogs on hard biscuits, as it is that their dogs refuse to eat them. Most dogs will refuse biscuits if meat is obtainable, and I myself would prefer to give meat to a dog than biscuit. My own dog receives 1 lb. of raw beef in bulk every night. She has to chew this up as it is too big to swallow without mastication. To amplify this diet she receives 10 or 15 Vimlets, a biscuit which few dogs have been known to refuse. My dog has never ailed all her life and she is now over two years.

I strongly advocate raw beef as a staple diet for dogs and cats. Speaking of cats, I find that pyorrhœa is comparatively uncommon in them, its site when present often being the canine teeth. In dogs its more frequent incidence seems to be in the incisors.

Mr. Gray touched upon a most important aspect of the question when he incriminated a septic condition of the mouth as a potent cause of other ailments, such as blindness, emaciation, loss of energy, convulsions, paralysis, etc. I believe he is absolutely right. A muddy gateway will cause a dirty field, and I am convinced that if the mouth is foul, the rest of the body will likewise so become ; at least, I make it a routine practice to examine the mouth and teeth in cases which offer difficulty as to their etiology.

In alluding to treatment, Mr. Gray commenced by sneering at vaccines, violet rays and the rest ; but he avoided allusion to ultra-violet ray, which is an entirely different thing from violet ray. The latter would conceivably be of very little therapeutic value in pyorrhœa, but ultra-violet ray has already proved of the greatest utility in the hands of medical men. Many cases of apparent cure or vast improvement have been reported, and only so recently as this month I read in the July *Veterinary Journal* of two cases of pyorrhœa and ulcerative stomatitis in dogs, even of so long as three years standing, becoming

entirely cured by ultra-violet ray. (See article by Walsh and Stainton.)

I know that since I installed my own apparatus I have been astonished at the healing power of actinic light.

As a mouth wash, one of the most successful I have employed is the following: Formalin, minims 10; water 6 oz.

This, at least, has the effect of hardening the gums and effecting their retraction, besides being a powerful antiseptic. Finally, in spite of what Mr. Gray has said, I find that many people *will* persevere with a soft tooth brush if advised, and I generally recommend either Eucryl tooth powder or Forhan's tooth paste. It may be remembered that some time ago, at a Central Meeting, Professor MacQueen told of the benefit he had personally received from the use of Forhan's paste in the treatment of loose teeth.

I compliment Mr. Gray upon his most useful and informative paper and only regret I am not able to argue with him in the flesh.

Mr. G. Elmes (St. Albans) said that they were all aware that no huntsman or kennelman dare give his hounds bones and that the foxhound practically never saw a bone; the fact that foxhounds and harriers were very short-lived was, therefore, an interesting confirmation of Mr. Gray's views, for he believed that it was due to pyorrhœa. If they examined the mouths of these dogs they would note an extraordinary thing—hounds of five or six years had mouths which resembled those of ordinary dogs of fourteen years.

Mr. F. A. Heney (Dublin) expressed his appreciation of Mr. Gray's paper, from which they could learn a great deal. He wished to make some reference to the use of radiography in connection with dental troubles. He had been in touch for some time past with a radiologist of some standing and he had been able to learn a good deal from him in that particular direction. He had availed himself of this gentleman's services in three or four cases with wonderfully interesting results and he hoped to make use of them in the near future to a still greater extent.

Captain Kirk had referred to the fact that he hardly ever saw pyorrhœa in cats. Cats in England might be very different from those in Ireland, but he came into contact with a great number of cats, and he could not confirm that view because some of the most interesting cases of pyorrhœa and general dental trouble had been feline patients. One case was a large tabby male cat, nineteen years of age, which developed tooth trouble. He took every tooth out, plugged the gums, and the animal lived several more years, developing a bone-like tissue in the gums. The end of the cat was that it came into fatal collision with a grocer's van.

As regarded the feeding of dogs being the cause of the disease, he could not say whether or not the soft feeding so common amongst dogs was responsible: he was rather sceptical about that. He fed all his dogs largely on flesh, and when he was showing bulldogs he invariably fed them on horseflesh with a little farinaceous food. Bulldogs were not so prone to disease as "my lady's dog."

He wished again to express his thanks to Mr. Gray for coming amongst them and giving them the benefit of his great knowledge and experience. He hoped that at some future date he could manage to go to London and pay him a visit to sit, as it were, at the feet of Gamaliel and endeavour to learn something from a teacher who was so able and willing to instruct. (Applause.)

Mr. W. J. Rice (Montrose) said that from his short study of this disease he was rather inclined to doubt that its cause was constitutional. He was inclined to regard it as something of a bacterial nature and which might be discovered in the near future. He was driven to take that view by the fact that extraction of teeth and local applications constituted the cure. He had in mind one case of a Pomeranian which was brought to him and which was sixteen years of age. Its mouth was a reeking cesspool, and he advised extraction of all the teeth and plugging of the cavities with a dry preparation of calcium chloride and boracic acid, which were the constituents of eusol. The dog made a perfect recovery and was now nineteen and hale and hearty. If the disease of pyorrhœa was constitutional one would not expect such a rapid recovery after local treatment. The dog in question was rather emaciated, but within a month it was putting on flesh. He suggested that if local treatment yielded such good results the cause of the trouble must be something local.

Mr. R. Ewing Johnston (Belfast), expressed some degree of diffidence in speaking, as that was the first Veterinary Conference he had attended since qualifying, but he had read Mr. Gray's paper and he wished to try to add something to it. He was glad to note that the essayist advocated one meal a day, because it was useful when you had dogs in your kennels not to have to bother with more. It was hard to convince those ladies that one meal was sufficient, with a hard biscuit.

With regard to ultra-violet-ray treatment, he was just beginning to take it up and he could not therefore say much about it, but he hoped to be able to report some progress with it at a future date, as he thought it was going to be quite useful in the smaller animals.

Mr. Hugh Begg (Hamilton) said he hoped that a mere veterinary inspector might be excused for joining the discussion on a paper on pyorrhœa, for he claimed to be a great dog lover and he wondered how it was that the general practitioners were shy in discussing that subject. Was it because they were rather afraid of the higher voltage of Mr. Gray in canine matters? He could assure them that Mr. Gray was a most kindly individual. (Laughter and applause.) The matter that struck him most in the paper was his direct way of going back to nature. He showed them clearly that by feeding dogs on soft food the circulation of the gums was at once modified in some way: that they began to lose vitality and became more subject to infections and less resistant to attack. He thought it was pitiable that dogs of two or three years of age should have mouths such as those they were constantly seeing. The conditions found showed clearly that the

lavage of the tongue on the inner aspect of the teeth kept that side of the dental arch fairly clean, and that the inner aspect only became affected by the trouble spreading from the outside. He thought Mr. Gray made out a very good case for the once-a-day method of feeding, as adopted by huntsmen. They had to thank Mr. Gray very heartily for his paper and to congratulate themselves on getting a man of such high standing to present a communication on that subject to the Congress. (Applause.)

A MEMBER remarked that he could corroborate the essayist's statement that interstitial nephritis was very common in dogs affected with pyorrhœa, for, in 15 per cent. of the dogs upon which he had conducted *post-mortem* examinations at a dog's home, the kidneys showed the disease. He wished to ask if the connection was direct. He also wished to be informed how Mr. Gray would tell the age of a puppy for licensing purposes — whether it was under or over six months.

THE REPLY.

Mr. HENRY GRAY (London), replying to the discussion, said: I thank you all most heartily for the manner in which you have received this paper. I may say that a distinguished man of science stated in the Press during the course of the war that the veterinary profession held medical science in the palms of its hands, and I agree that that is so.

The subject of this paper is of far greater importance outside the profession than in it, because it has a bearing on the cause of pyorrhœa in the human race and, from my observation, there are very few people in middle life who are not the subjects of this disease. There is, I maintain, only one cause of pyorrhœa, and that is, not using the teeth in a proper way and as nature intended that they should be used. As to infection, that is only secondary: the germs are always in our mouths, they cannot develop if the gum is kept in a perfect state, physiologically. It is like having a garden path—if you are always walking on it the weeds cannot grow and it becomes hardened. It is the same with your gums. When you are pressing on your teeth the blood supply to your gums is stimulated and they are fortified against disease.

Professor O'Connor has offered no criticism, all he has done is to fortify our knowledge of this question. As to Captain Hamilton Kirk—well, he always puts the cart before the horse. (Laughter.) I quite agree that if a tissue is not in a proper physiological state it is more likely to be a suitable soil for the parasites in the mouth to develop and invade the system.

Concerning radiology, that is not practicable in the veterinary profession. I never met with anybody yet who had cured pyorrhœa by this fancy treatment. We have either to kill or cure the patient and your clients won't pay you for this unproductive fancy work. There are radiology, ultra-violet rays and what not, but I regard the whole thing as sheer bunkum. (Laughter.) Let us get to the prevention of it. (Hear, hear.) Mr. Elmes's remarks are most valuable and I am surprised that more veterinary surgeons in the country have not told us of the state of the mouths of the dogs with which they meet. Mr. Elmes's statement in regard to the foxhounds goes to show that soft feeding is the only cause of pyorrhœa. Practically all the aged dogs I have seen with perfect teeth have been dogs used in the country. It is a question of the gum, and to get a perfect gum you must have the teeth used, when they wear them down in a level way. One hundred per cent. of the dogs not allowed bones have pyorrhœa by the time they reach middle life. It is not necessary for them to have tartar to have pyorrhœa, but when they have tartar it shows that they are not using the teeth.

The experience related by the gentleman who referred to his treatment of a dog of 16 years of age goes to show that when the teeth are removed the effect ceases.

In regard to estimating the age of puppies, it can only be done approximately; one must use one's judgment, because, from a prolonged study of a great number of dogs of known ages, I defy anyone to tell a dog's age by the teeth alone. What is taught in the colleges and text-books is all nonsense: the question has not been studied from a long series of dogs of known ages. One cannot lay down any rule.

As to puppies, it depends on the breed. Some breeds have the fontanelles open for the duration of their lives and also have fewer teeth and with absence of the *fleur-de-lis* on the incisors. The Pomeranian does not get a full dentition until it is seven or eight months and then many of the temporary teeth are not displaced except by extraction. On the other hand, the larger breeds erupt their temporary teeth much earlier and have generally a complete dentition by the time they are five or six months old. One cannot go by the wear or cleanliness of the teeth, for some dogs, whatever their ages, may show no signs of wear of the teeth, whereas others wear them down almost to the gum before they are two or three years old. As there cannot be any law laid down, the question of age becomes a matter of opinion which may as often be wrong as right. Still, as to whether a puppy is six months or over, one may conclude he has reached that age when he has a full dentition of permanent teeth, which may be fewer in the short face than in the long-face breeds. One should also be able to say if a dog is a puppy or an aged one.

I thank you most heartily for listening so patiently to my somewhat disjointed remarks.

IMPORTANT CASE WON.

Under the above heading a paragraph appeared in the July issue of the *Journal of the American Veterinary Medical Association*. As it may prove of interest to our readers and, indeed, to a large section of the agricultural community, we reproduce the paragraph in its entirety:

"The U.S. Department of Agriculture won a decision over the Bowman Remedy Company, of Minnesota, in the legal battle fought in Cleveland the early part of May. The suit was the culmination of investigations conducted by the Bureau of Chemistry of the U.S. Department of Agriculture and the District Attorney of Cleveland. The trial was held before Federal Judge Paul Jones and came to an abrupt end when the defendant failed to produce testimonial witnesses. The Government was backed up by an imposing array of expert veterinary talent, called to Cleveland to give expert testimony. The result of the suit is to exclude a notorious bran-and-brown-sugar abortion nostrum from interstate commerce."

East Coast Fever.

By G. B. Purvis, F.R.C.V.S.

This is an extract from my thesis presented recently for the Fellowship Degree of the Royal College of Veterinary Surgeons.

In this paper I shall confine myself to the original matter of my thesis, including besides that such general matter as is not well known (or is otherwise worth discussion). All my own experience of the disease has been gained in Kenya Colony.

East Coast fever is a specific disease of bovines caused by the parasite *Theileria parva*, and transmitted by ticks of the genus Rhipicephalus. It is distinguished from Mediterranean Coast fever, caused by *Theileria dispar*, by being non-transmissible by inoculation of blood from infected animals. At present it is safer to regard all Rhipicephalus ticks as possible carriers. In Kenya cases have been recorded in imported Indian buffalo. While Theileriæ have been reported from various other ruminants, there is no evidence to show that these parasites cause the disease of cattle with which we are dealing and, in fact, the available evidence indicates the opposite.

Theileriæ have been reported from cattle in S. Russia, China, India, etc., but since the recognition of *T. dispar* no attempt has apparently been made to determine to which species the reported parasites belong, and it would appear on what little clinical evidence exists, that they are *T. dispar* rather than *T. parva*.

The disease, in the present state of our knowledge, is recognised in Kenya Colony, Uganda and the Eastern Belgian Congo, in the Northern part of Nyassaland, in a part of Northern Rhodesia, in Southern Rhodesia and the Union of South Africa. There is some doubt as to whether the disease occurring in the Sudan is due to *T. parva* or *T. dispar*(1). The Portuguese claim to have eradicated the disease from Portuguese East Africa(2). The disease would appear not to occur in Madagascar(3). The disease is enzootic in parts of Uganda, Kenya Colony, Tanganyika Territory and Nyassaland.

With the possible exception of parts of Northern Rhodesia and Zululand, the disease has not become so firmly established elsewhere. Generally speaking, the country in which enzooticity occurs, or is likely to occur, is well suited to tick life, and contains a heavy concentration of cattle. The clinical differences seen between the disease as described in Southern Africa and in Kenya Colony—as set forth in this paper—are to be ascribed to the differences in general conditions. In enzootic areas the mortality is confined to calves; it causes a relatively slight mortality, is largely concealed by concurrence of other diseases, and such mortality is considered normal by the owners and all others concerned.

In newly-invaded territory, or where all precautions are taken to prevent it becoming enzootic, only epizootics are seen, and the mortality and other clinical characters of the disease vary a good deal. In Kenya, where we get true epizootics, we can recognise no clinical differences from the S. African descriptions. The whole difference seems to me to be due to the fact that in Southern Africa they are dealing almost entirely with epizootics, and in Kenya we are dealing mostly with the enzootic form of the disease. The disease in Southern Africa arose from the same enzootic area as that which embraces much of Kenya Colony, the artificial boundary between Tanganyika Territory and Kenya splitting tribes. In Kenya all observers have recognised but one clinical entity throughout.

Cross-immunity tests conducted by Montgomery(4) and Theiler showed no difference between the diseases described as East Coast fever in S. Africa and Kenya respectively. There is, one must admit, some doubt as to the value of this method with Theileriæ.

Transmission of the Disease. One point may be worth considering here. As blood inoculations have failed to transmit the disease, and as blood may contain gamonts (enclosed in lymphocytes), and as spleen and gland inoculation can transmit the disease containing only agamonts over and above the forms occurring in the blood, there is reason for suspecting the agamont to be the form of the parasite able to transmit the disease by artificial inoculation. In Mediterranean Coast fever blood inoculation suffices to convey the disease: then, do agamonts occur in the blood? If not, I should like to experiment by taking blood from a case of East Coast fever in which many gamonts could be found, centrifuging to isolate the white cells, adding peptone and trying transmission to susceptible animals.

Symptoms. The first symptom is a fairly sudden rise of temperature to 104 degrees F., 106 degrees F. or more. This may take two or three days to reach its maximum, but the charted rise is abrupt. Concurrent with this, the external lymphatic glands may show enlargement, but this may not show, and usually does not become marked until the third to fifth day of temperature reaction. I have seen two fatal cases in which I could not detect this enlargement of the external lymphatic glands, but this is quite an exceptional occurrence.

At the beginning slight constipation is usual, but this disappears usually after about two days. To an unskilled observer nothing is wrong, and the history may be "the animal did not feed very well yesterday, it was ill last night and dead this morning." The appetite is maintained until shortly before death in acute cases.

As the disease progresses, loss of condition shows, the animal may be noticed dull and lethargic, the enlarged lymphatic glands may be seen, and diarrhœa sets in. Dysentery may reveal itself. In most cases flecks of blood appear in the fæces, but blood may be so abundant as to lead to a suspicion of rinderpest. Blood in small amount may be seen from the ears and nose.

In subacute and chronic cases loss of condition is more marked to prominent. In Kenya we recognise such cases and have proved their existence in exposure experiments. In these cases appetite disappears longer before death, and the animals may grunt and

strain, indicating abdominal pain. There is a clear watery discharge from the eyes, and the conjunctiva shows anæmia with congestion of the blood vessels. Towards the end the lungs become involved, œdema setting in with exudation of a clear fluid into the bronchioles, this being churned up with the air to give a white or blood-stained froth, which may be coughed up. The cough is soft in nature. Death occurs in coma and is usually attended with struggling, although the animal appears to be quite unconscious. Delirium has been described. I have not seen this though the animal may be dangerous if interfered with, but this occurs in other diseases, *e.g.*, contagious bovine pleuro-pneumonia, where there is not necessarily a high temperature.

After the first early rise of temperature already mentioned, there is a partial remission for two or three days, and this is succeeded by another rise, approximately to the same level as the first. This double rise with a partial intermediate remission is typical. After this, variation occurs. In animals which recover the temperature usually falls here, Koch's bodies disappear and recovery follows slowly—subject to complications. Death may follow two days or more subsequent to the second rise, the temperature remaining up, to drop suddenly. In other cases the temperature fell slowly prior to death.

In one fatal chronic case the animal showed a moderately raised temperature for almost a month subsequent to the initial double reaction, and showed Koch's bodies at intervals over the period of a month, at these times the temperature being but slightly elevated (about 103-103·5 degrees F.).

Complications : exposure to weather, work, exercise, lack of or excess of food are unfavourable. Any other infection is very apt to prove fatal. Redwater (*P. bigeminum*), anaplasmosis (centrale or marginale) and infection with *Spironema theileri* may prove fatal. Redwater was the commonest and most fatal complication in experiments. Young animals that had passed through severe attacks lost their tolerance and suffered from relapses, often severe. I have not seen personally a relapse due to anaplasmosis : the cases I had were all apparently concurrent infections.

Animals over two years of age previously immune to the other tick-borne diseases did not suffer from them again.

Mortality. The only point worth discussion here is that in animals under 14-18 months old the mortality progressively decreases as age decreases, until in sucking calves mortality is at its lightest. This can only be seen in an enzootic area. In epizootics the cows lose their milk or die, and the calves are starved as well as themselves suffering from the disease. It is one point on which all observers in enzootic areas in Eastern Africa agree.

Diagnosis. At this date it would appear unnecessary to insist that diagnosis can only be based upon the finding of Koch's bodies. These rarely occur in the blood, yet Edmonds(5) advocates the taking of blood smears from the live animal. As Koch's bodies are rarely in blood or, when present, are very rare, or rare, this is rather ridiculous. Puncture of the external lymphatic glands to secure gland substance for examination should be resorted to in the live animal. Apart from exceptional cases (reported by Wm. Robertson and R. E. Montgomery) in which no parasites can be detected, Koch's bodies are not discoverable until the climax of the first rise of temperature and usually not until that of the second rise. In recovered animals reacting to re-exposure after a short interval Koch's bodies are usually rare or very rare. In chronic cases Koch's bodies are usually very rare after the first two big temperature rises.

Post-mortem. Kidney infarcts appear to be far more frequently seen in S. Africa than in Kenya. The gastro-enteritis should not be emphasised in importance in areas where rinderpest may occur, as these lesions in both diseases are not distinguishable.

Treatment. Natives in enzootic areas in Kenya and some Europeans cauterise with hot irons over the enlarged external lymphatic glands. As we do not know upon what factors recovery depends, there may be something in the method.

I wish to emphasise the importance of rational hygienic treatment. Natives of some tribes in Kenya have long recognised this. Spruell, in his report on the Transkei inoculations, reports greater losses than usual having been due to unfavourable weather conditions. It is obvious that an animal with a temperature of 104 degrees F. or over must be treated with the utmost care, yet, in practice, many people take no trouble and blame the disease alone for the mortality. I have found the following measures useful :—

1. Feeding sufficient good green food (or milk) and not too much ;
2. Avoiding extremes of heat and cold ; work, exercise, or excitement ;
3. Keeping the animals dry and warm.

Prophylaxis. Hand de-ticking : it is not generally known that this method has been introduced at all. The Germans began it in Tanganyika Territory. It will bring about slow eradication of ticks by destruction of engorged females and a few engorged nymphs. The method is a poor and slow one, and I consider that it would eventually, in an enzootic area, become harmful if it produced sufficient diminution of the tick population. Production of immunity naturally, with minimum loss, requires the certain infection of calves at a very early age, and if this is not brought about infection later in life causes heavier mortality.

Dipping in enzootic areas must similarly be approached with great care—especially so in native territories, where any set-back is fatal to holding the confidence of the natives. One must not interfere with the natural immunisation of calves until one can give them as complete protection from infection in later life as is possible.

Natural immunisation depends upon the presence of many infected ticks. The tick population cannot be reduced quickly to a sufficient degree, nor can properly conducted dipping with all the additional safeguards

known protect these calves from infection in countries like Kenya Colony. Dipping, etc., are quite efficient in dry countries or in dry seasons, but in the rainy seasons of countries like Kenya Colony dipping, etc., are not efficient.

Dipping is immersing animals in a watery solution of sodium arsenite—the animals are dry in about half an hour. Arsenic is stored in the skin(6). Ticks are prevented from attaching for about five hours by the paraffin (if any), but the residual arsenic poisons ticks that attach after that and before the next dipping in regularly and properly-dipped cattle. Now consider the animal exposed to rain. There has, as far as is known, been no change in composition of the arsenic. The animal must be considered as being wet for some hours, and likely to lose that residual arsenic which is its safeguard. Experiments are required on the point, but experience has shown that dipping cannot be relied on in the wet seasons in Kenya Colony. Hornby mentioned to me a similar experience at Mpapwa.

IMMUNITY. Various authors have endeavoured to explain the survival of cattle in enzootic areas as due to inherited immunity. Against this I wish to quote the case of the Elgeyo Native Reserve in Kenya Colony. Here the disease entered first during the war and caused the huge mortality usual in epizootics, yet, in 1923, the mortality was apparently that usual in an enzootic area, which this Reserve had become. One cannot credit such a startling difference of mortality as being due to inherited immunity in those few years. I believe all immunity to East Coast fever to be acquired immunity.

It has always been considered that immunity in East Coast fever, once acquired, is permanent and impossible to break down by other infection, reinfection or super-infection. It has also been thought that parasites, on recovery, disappear entirely and finally. This view of permanence of immunity has originated from South Africa and is of long standing. I do not know of any recent work on this matter. It arose from the failure of "salted" or immune animals to die from the disease in subsequent outbreaks in which they were exposed. This evidence, scientifically speaking, is of no value unless (i) the animals were proved to have had the disease, *i.e.*, showed Koch's bodies; (ii) the animals were satisfactorily proved to have been exposed to infection.

Under (i) we have to consider that in most, if not all cases the animals were merely survivors, which proves nothing, and under (ii) we have to consider that in these outbreaks everything was done to clean up the outbreaks as soon as possible. If the animals were shown definitely to have had the disease first, and then were kept a long time exposed to infection, after an interval of non-exposure, by provision of many infected controls and encouragement of ticks, this evidence would be admissible. I know of no such evidence. The interval of non-exposure to infection is vital, as will be shown later in this paper.

Additional proof has been drawn by these observers from the fact that in an enzootic area no deaths from the disease occur in adult cattle. This would apply equally in *P. bigeminum* infection, but here we know that a long interval of removal from infection of an immune beast results in loss of that immunity. So, too, does it in East Coast fever. I discovered this fact thus: I was first working in an enzootic area, where I endeavoured to determine the factors controlling natural immunisation. In 1923 I was in an enzootic area also (Uasin Gishu and Trans-Nzoia districts), but here I had farms on which dipping was carried on in the middle of the enzootic area. East Coast fever is here not on our schedule of contagious disease (it is scheduled in the so-called "clean areas" only) and, in consequence, I was only called in on these farms—"dipping farms," for brevity—to determine the cause of epizootics and give advice—where East Coast fever was concerned.

Fencing was impossible in the Uasin Gishu on account of big game. Trespass of native-owned cattle from enzootic area (including calves suffering from the disease therefore) was impossible of prevention by night, the Uasin Gishu being a narrow strip between two Native Reserves occupied by kindred tribes. Where I investigated these epizootics, then, I found some cases of East Coast fever, making my diagnosis by finding Koch's bodies, I went into the farmer's methods, told him what to do, and that ended it. Some of the man's calves would die and others, apparently suffering from the same condition, recover.

I found some men did not dip their small calves, but kept them in, feeding veld grass and allowing them to suck their mothers night and morning. On examining such calves one found Rhipicephalus ticks, and clinical symptoms of East Coast fever in all, or nearly all. I could not understand, then, the susceptibility of the adult cattle to the disease. I was satisfied that under the lax methods followed by the farmers with their calves, practically all calves got the disease, yet the survivors were susceptible later in life. By the end of 1923 I had concluded that

1. The younger the calf, the less likely to die when infected.
2. Mortality depends largely upon rational treatment.
3. Immunity is temporary.
4. Re-infection can and often does follow a break in exposure to infection.

There can be no doubt that adult cattle from enzootic areas have a long-lasting degree of immunity. The Veterinary Department in Kenya honours them with a special brand and practically none have been recorded as dying from the disease later. Experiment is required to determine the duration of immunity in this class of animal.

Points 1 and 2 are matters of observation only.

Points 3 and 4 are of real importance, however.

While on leave in 1924 I did a course of P.-G. study at Onderstepoort Laboratory, Pretoria, S. Africa, and discussed my observations with Sir A. Theiler, du Toit, Hornby, etc., who thought them important and worth taking further. Accordingly, I wrote to the Chief Veterinary Research Officer, Kenya Colony

(J. Walker), and on my return talked the matter over. The Chief Veterinary Research Officer experimented upon these lines, and during my last ten and a half months in Kenya I was at the laboratory myself, and assisted with some of the experiments. In order to procure animals of all ages known to have recovered from one attack of the disease, Mr. Walker used Theiler's immunisation method the mortality in susceptible animals on exposure alone making the latter method impossible.

The animals which on subsequent exposure reacted to that exposure with exhibition of Koch's bodies were used in further exposure experiments after removal from infection, hand-dressing, and dipping. Some of them, on re-exposure to infection, gave no reaction. The majority gave reactions and can be divided into :—

1. Those showing no parasites ;
2. Those showing parasites in the red blood corpuscles only ;
3. Those showing Koch's bodies. In these most showed very rare Koch's bodies, but some showed them frequent and most of these died.

In the experiments 1 and 2 were not put down as cases of re-infection ; they were suspiciously so on analogy with cases which gave similar reactions but showed Koch's bodies also.

Adult animals were found to have no particularly greater amount of immunity as the result of recovery from one attack of the disease. As the adult animal from an enzootic area apparently has, experiments are required to prove it and to endeavour to determine its amount. In experiments done before I was sent to the laboratory Mr. Walker informed me that a larger proportion of the recovered animals showed Koch's bodies again on re-exposure and that more died. The intervals of removal from exposure were six and eight weeks respectively. Thus, my 1923 conclusions 3 and 4 proved to be good.

I cannot give the experiments or results of them in full as, although due to my observational work, the experiments were not mine. Mr. Walker will no doubt publish them in full in due course.

Southern Rhodesian veterinary opinion is strongly in favour of the recovered animal being considered as a reservoir of infection. I cannot myself take this seriously in the absence of all scientific evidence. In my own case I *could* have published in 1923 (I wrote Sir A. Theiler through Chief Veterinary Officer, Kenya, and J. Walker, in 1924), but I should not have expected acceptance of my work without the experimental evidence which Mr. Walker has produced of its correctness.

Practical Immunisation. I have already pointed out the great difficulties under which the owners of "dipping farms" in enzootic areas labour. If they continue dipping they lose cattle and expend money and time. If they stop, they lose nearly all their cattle and have to start again. As some of these men were actually contemplating stopping dipping about the end of 1923, I fixed up a method for trial by them on the principle that it could not possibly be worse than stopping dipping and standing the resultant loss, and might be a great deal better. This was to keep the adult cattle dipped as before and try to copy natural immunisation of calves, as occurs in enzootic areas. This involved the creation of a local enzootic area by bringing all natural cases into one area, and leaving them undipped to infect and encourage the ticks. Calves were to be exposed here from birth. The area was to be gradually enlarged, steadily to increase the dirty area. The adults were to be herded away and used for the supply of calves until an immune herd resulted, when they could be sold out to the butcher slowly and dipping abandoned entirely. I did not consider that one attack produced permanent immunity, hence my advising increasing the size of the dirty area and a final abandonment of dipping. All the people concerned thought the scheme was good but were afraid to try it, but the least enthusiastic—a canny Scot—thought it over and tried it. He used to lose 70-80 per cent. of his calves annually, and all the smears he brought in from them showed Koch's bodies. He was rearing as many as he used to lose when I last heard of him in November, 1924. Scientifically, this proves nothing much, but practically we know that :—

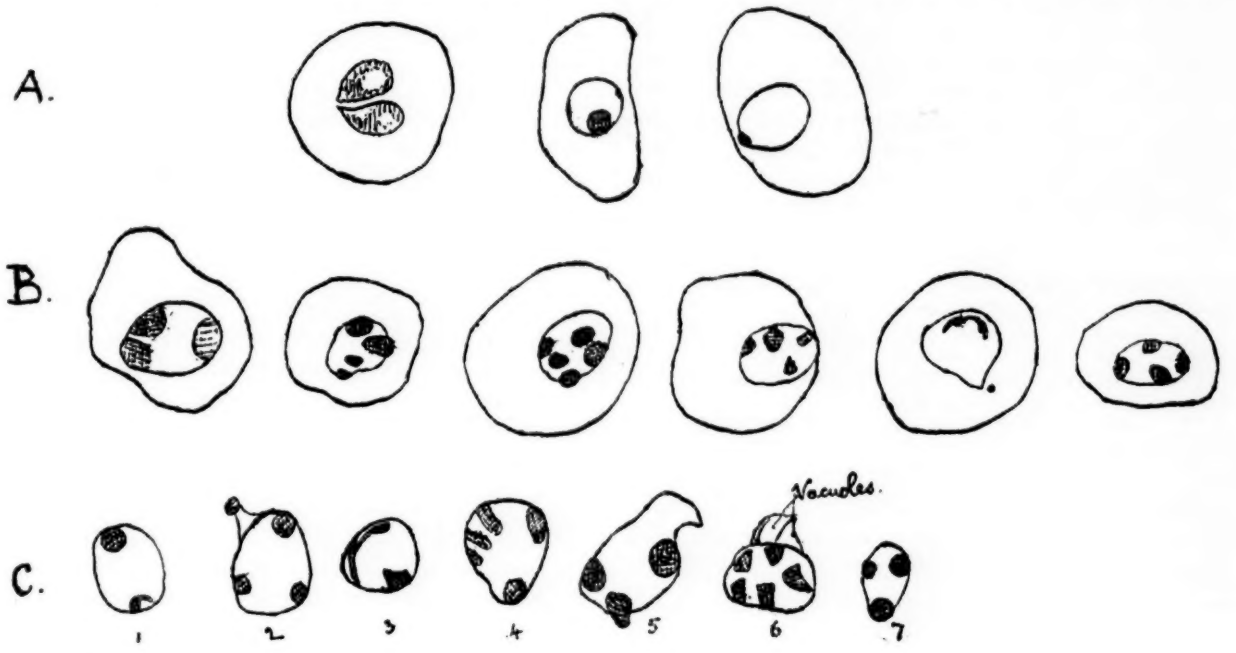
1. He had East Coast fever which caused his losses ;
2. That we encouraged the disease and its carriers (although the disease does not usually require encouragement) ;
3. That he now rears as many calves as he used to lose.

In the circumstances, an immunity test hardly seems needed. This method is particularly applicable to high cold areas (*e.g.*, Burnt Forest, Kenya Colony), where ticks are very scanty, but nearly all the calves die. Dipping could easily succeed fully here, but susceptible cattle in Kenya are worth so little that it is not advisable. Pure-bred bulls, or a pure-bred herd could, if desired, be established in enzootic areas by this method.

Analogy. East Coast fever has been distinguished from Mediterranean Coast fever mainly on two grounds : inoculability of the disease by blood drawn during the paroxysms and the immunity being but temporary in the latter disease. The latter difference has been shown in this paper not to exist. I am quite unaware of any work having previously been done to test immunity to East Coast fever *after an interval of non-exposure to infection*. I believe that it is entirely owing to this, that the non-permanence of immunity has not previously been detected. No tick transmission work on Mediterranean Coast fever has apparently yet been done. It is believed, however, that other than Rhipicephalus ticks are the carriers. I consider that it is essential that work on both diseases should be done side by side, to determine whether or no the diseases are separate entities. The type of immunity here shown to exist in East Coast fever is analagous with that to *Piroplasma bigeminum* ; in both immunity is non-permanent, requires re-infection for maintenance and becomes lost after an interval of non-exposure to infection.

Bovine X169. Born 18th September, 1925.

15th December, 1925. Showed *P. bigeminum* f. frequent. T. blue administered intravenously. Died 16th December, 1925.



Stained with Giemsa $\frac{1}{10}$ for 20 minutes.

A. Forms of *P. bigeminum* representative of those usually occurring subsequent to treatment of the host with trypan blue.

B. Unusual intracorpuscular forms: cytoplasm staining light blue except that on the extreme right which stained as blue as an agamont of *P. parva*.

C. Unusual forms free in the blood. Of these the cytoplasm of Nos. 1 and 7 stained a similar blue to that of agamonts of *T. parva* Nos. 2 to 6 being a shade lighter.

Some forms in B. and C. will be noted to show irregular chromatin granules (nuclei). In B. and C. the chromatin stained purple as in Koch's bodies.

Whilst working with *P. bigeminum* infection as a complication of East Coast fever I got an astonishing result on one occasion, possibly indicative of a still closer analogy between this piroplasm and Theileria. This was in a calf X169, born 18th September, 1925. It went through a short typical reaction to East Coast fever on exposure—not having been immunised. Four or five days after, the temperature had returned to normal: a rise again occurred on 15th December, 1925, and *P. bigeminum* occurring fairly frequently in the blood, it received at 4 p.m. a proper dose of trypan blue intravenously. At 7 a.m. next morning it was dead. Spleen and gland smears showed no Koch's bodies but, while some of the red blood corpuscles showed the degenerative forms of *P. bigeminum* usual after trypan blue treatment, others showed intracorpuscular plasmodial bodies and other plasmodial bodies occurred free. A drawing of these forms is here reproduced. I have in no work seen mention of such bodies (7).

Conditions in Kenya Colony. As my experience has been acquired in Kenya, I shall conclude with a few remarks on the local conditions there. In Kenya the attempt is being made to keep clean the areas which remained clean after the War. As ticks are fairly abundant in much of the clean area, it cannot be expected to remain clean long, nor can outbreaks be readily checked. A compulsory dipping ordinance (1920) exists, but has never been enforced owing to a contained provision that funds must be made available for loans to farmers to erect dips. These funds are not yet forthcoming.

Unfortunately, the whole question of East Coast fever in Kenya is bound up with the labour question. Much of the available labour on European farms consists of natives resident there with their stock. They are unwilling to dip their cattle as, on return eventually to enzootic area in Native Reserve, their cattle will die. Thus, any attempt to introduce compulsory dipping on European farms would result in a wholesale emigration of labour, and paralysis of the farming industry. Under the Resident Natives' Ordinance the European farm owner must brand the cattle of these natives with his own brand, and the letter S and keep a register of the stock. The inspection of registers and stock is supposed to be done by the Administration who, I can personally vouch, have not the time, and who obviously have not the training for stock inspection work. The result is that there is no supervision of the scheme, that the cattle are not branded, and that the natives move their cattle to and fro between farms and between farms and Native Reserves in a wonderfully casual manner, spreading diseases wholesale. There is no legal provision to make compulsory cancellation of the European's brand on cattle leaving a farm, so that the branding provision has been made useless.

The only possible way to make this ordinance work, in so far as its control of cattle is concerned, is to transfer the control of the stock registers and stock inspection to the Veterinary Department, with provision of sufficient stock inspectors to do the work efficiently. The Ordinance requires, in addition, to make compulsory the cancellation of brands on cattle leaving farms. It will not be possible to begin compulsory dipping in the enzootic settled areas until it is also begun in enzootic native reserves.

REFERENCES.

(1) *Report of the Fifth Pan-African Veterinary Conference*, 1923, p. 26. Knowles.
(2) *Report of the Fifth Pan-African Veterinary Conference*, 1923, p. 22. Dr. Botelho.
(3) *Report of the Fifth Pan-African Veterinary Conference*, 1923, p. 25. Major Tissie.
(4) *Annual Report Veterinary Pathological Laboratory, Nairobi*, 1911-12.
(5) *Dis. of Animals in S. Africa*, p. 236.
(6) Watkins Pitchford: *First, Second and Third Reports* on Dips and Dipping in Natal.
(7) Castellani and Chalmers *Manual of Tropical Medicine*, 1919, pp. 494 and 497; life histories of *P. bigeminum* and *P. canis*.

Utilisation of Wild Animals.

The African Elephant.

The scientific correspondent of *The Times*, writing to his paper recently, says:—

"A question asked in the House of Commons last week raised, although in not the most happy way, the interesting and important matter of the utilisation of wild animals. Sir Gerald Strickland asked the Colonial Secretary to refer to a committee, dealing with the exploitation of whales, the utilising of elephants and elands in Africa. Most persons, except those whose local interests are directly affected, must desire the preservation for the benefit of future generations of some of the magnificent wild animals now in danger of extinction. Everyone must wish that somehow or other the giant stag of Ireland or the superb wild ox or aurochs of Europe had been preserved. These and many others are gone. The American bison was preserved by a great effort, when the total numbers in the continent had been reduced to a few hundreds. The European Bison Society is attempting the harder task of recovering a species reduced, not to hundreds, but to dozens. Strict protection, in Norway, may still save the European beaver, and the chamois, in great danger a few years ago, is now believed to be safe.

"In no part of the world are large wild animals at present more unique or more in danger than in Africa. From the Sahara towards the Cape are many species found nowhere else on the globe, even in recent years abundant, but now disappearing rapidly, partly from deliberate destruction, even more from the encroachment of cultivation and civilisation. Game reserves now being established or about to be established will do much, especially if there is adequate watching by game wardens. But there would be a secure future for animals that could be turned to economic use under conditions of semi-domestication. Sir Gerald Strickland cited the elephant and the eland as examples, but the zoological information supplied in his question was inadequate.

"It is no new experiment to breed elands. On many private estates in this country and elsewhere, and probably in all zoological gardens, elands have been bred successfully and without any difficulty. They are gentle and hardy, and require no more shelter from the weather than many breeds of cattle. In Africa their resistance to the ngama disease carried by the tsetse fly might make them useful in regions in which cattle cannot thrive. Their hides are suitable for tanning, and their meat is well-flavoured. Before the war experiments were made in this country in castrating young males and fattening them for the table like oxen, and there is no reason why this should not be done on an extensive scale in Africa as the species is polygamous and any herd would produce more male calves than would be required.

"Elephants, both in Africa and Asia, are in a different category. They are not capable of domestication in the true sense, as it is the rarest of events for them to breed in captivity. For some unknown reason captive elephants have bred rather more often in Siam than in India, although in the latter country the management of elephants has been extremely efficient for many centuries. In actual fact, elephants in India, Siam and Burma are tamed wild animals—each individual caught in its native haunts where it was bred, and not born in captivity. Experience, therefore, suggests that if elephants are to be used on any large scale for economic purposes in Africa the supply must be drawn generation after generation directly from the wild stock. The maintenance of a sufficent wild stock would require extensive reserves abundantly supplied with water and sufficiently far away from the wheatfields and shambas which these wide-ranging animals like to ravage.

"Sir Gerald Strickland exaggerated when he said that the possibility of utilising the African elephant was a 'rediscovery' of the Belgians. There is no difference between the docility or the intelligence of African or of Indian elephants. In many zoological gardens African elephants have been trained to carry children and to obey their keepers quite as well as those from India. They are less familiar in captivity simply because of the greater difficulty of transport and the absence of organisation for capturing them in Africa. In prehistoric times, and possibly even in historic times, elephants were found far north of the Sahara, and were at least as familiar in the arenas of Rome as the Indian species. Now they are all separated from the Mediterranean by wide stretches of desert across which the transport of elephants would be impracticable. The occasional examples captured in the tropics or from the few survivors in South Africa have to be brought long distances to African seaports in charge of persons with little experience of elephants. If any serious attempt is made to use African elephants on a large scale, the first step will be to transport to Africa Indian, Burmese, or Siamese natives of the elephant caste.

"With experienced management there is no reason to doubt that the African elephant could be used for the same

(Continued at foot of second column next page)

The Veterinary Record.

25th September, 1926.

ORAL SEPSIS.

The discussion arising out of Mr. Henry Gray's paper on " Pyorrhœa in the Dog and Cat " marks an important step in our conception of the causes and effects of oral sepsis in the smaller animals. Pyorrhœa is, in our patients, very largely the result of domestication and, whilst the purely local effects of the disease are of great interest, it is perhaps even more important to bear in mind the influence upon the general health and well-being of the animal which may be produced by a chronic focal sepsis.

The etiology of pyorrhœa has long attracted the attention of the Medical Profession and, whilst one meets with widely divergent views, it is generally accepted that the commencing lesion is essentially a marginal gingivitis, extending by way of the periodontal membrane and lamina dura to the cancellated bony tissue. That such is the case is largely due to the extensive investigations of COLYER in regard to periodontal disease. The disease is present to a very great extent among the smaller animals and the statement of GRAY that nearly one hundred per cent. of dogs fed upon food requiring no demand upon the teeth exhibit pyorrhœa, is one which provides a subject for thought, more especially when coupled with the view that it should be essentially a preventible condition. The contention of the author that the chief factor in causation is the improper use of the teeth will meet with general approval; at the same time, it is quite likely that certain predisposing factors may be of importance. Among these may be mentioned the difference in conformation of the skull in different breeds; the question of spacing or overcrowding of the teeth in the dental arcades, and the apposition of the teeth when the mouth is fully occluded. As regards the latter point, it is of interest to note that frequently a tooth that is in poor appostion with its fellow may be one of the first in a mouth to exhibit the condition of pyorrhœa. The recent experiments of MELLANBY with regard to the influence of diet upon the growth and structure of the tooth itself are of interest in reference to the onset of the disease, whilst, as was pointed out by the opener of the discussion, the evil affects of in-breeding should not be forgotten. GRAY has pointed out that the *work* of the teeth is of paramount importance, since the disease is met with in animals fed on meat which is chopped or minced as much as in those fed upon a sloppy or biscuit material. Arising out of the work of the teeth in preparing the food for deglutition, the most important result is *friction*, producing a firm, healthy gum tissue with an adequate circulation.

Perhaps the most interesting part of the paper deals with the far-reaching general effects of oral sepsis, and the importance of focal infection with regard to the causation of gastro-intestinal, arthritic and nervous symptoms cannot be too well emphasised: wherever the latter conditions co-exist with a septic focus in the mouth, it is essential that the elimination of that focus must be the starting point of treatment. GRAVES has recently shown that in man, there is a close connection between mental disorder and focal sepsis and that, in such cases, the correction of oral sepsis has been of great value in improving the mental condition. GRAY has drawn attention to the possible connection between a septic condition of the mouth and chronic vascular keratitis in the dog. This condition of keratitis is subject to periods of exacerbation, possibly influenced by the presence of an endogenous toxin, and it is quite feasible that a septic focus in the mouth may provide the source of infection.

It is now very generally held that pyorrhœa, as a disease, may be controlled by a suitable food supply—if, therefore, we supply the dog and cat with a rational food given to them in a form with which they are by nature fitted to deal, it follows that the incidence of the disease must diminish. That the introduction of such a rational system of feeding meets with some opposition is only to be expected and this opposition must be overcome by the gradual enlightenment of the owner as to the animal's requirements.

(*Continued from previous page.*)

purposes as the Indian species. Certainly they were used on a large scale in ancient times. The Ptolemies used them. Ptolemy Philadelphus had an elephant kraal somewhere on the Red Sea, probably in Somaliland. About the time of Hannibal, a Ptolemy had 73 elephants in a great battle against Antiochus the Great, who had 150 Indian elephants. The Carthaginians employed elephants in such very large numbers that it is incredible to suppose them to have been brought from India when there were plenty near at hand in Africa. The ancients were well acquainted with both species, noting the difference in the quality of their ivory. On coins of undoubted genuineness Indian elephants are figured and also African elephants with their riders. Although Mr. Amery could not suitably refer the exploitation of the African elephant to the Whale Protection Committee, the matter should not be dropped."

CLINICAL AND CASE REPORTS.

Wire From the Stomach.

By F. T. Harvey, F.R.C.V.S., St. Columb.

In *The Veterinary Journal* for November, 1920, the writer recorded a series of cases of foreign bodies occurring in unusual situations, and since that time wires have been extracted from the parotid region, the neck, the chest, and the thigh of different bullocks, and another case is here recorded.

A Guernsey heifer calved on June 12th and showed nothing amiss for seven days. She then appeared to have some stomach trouble. The rumen was distended, and there was much grunting, especially when recumbent, also constipation, disinclination to move and lessened secretion of milk. Two days later the appetite returned, also rumination, and the milk yield improved and continued fair until July 27th, but the owner noticed during the period that the heifer never lay on her right side, grunted a good deal when down, and seemed to have some difficulty in getting forward her right hind leg when walking. At the latter date (July 27th) a diffuse swelling with a hard and painful centre appeared on the right side, but the general symptoms were good. On August 3rd, a small abscess pointed and on the following day the owner, when bathing the parts, had his finger pricked and presently was able to withdraw a piece of wire 2½in. long with sharp ends. The wire came through about two inches behind and below the so-called "milk hole." The heifer now lies on either side, does not grunt and appears quite well.

Remarks.—The case is a simple one, but interesting, having regard to the clinical history. The wire took an unusual course and had probably passed into the omasum or abomasum and so was not drawn towards the heart. Abscesses or fistulous openings of indefinite origin, and unassociated with glands, occurring in cattle along the trunk, are always suggestive of foreign bodies from within and these latter may be found in great variety. It is curious that the very interesting case of the Friesian bull, which was recently before the Scottish Courts and reported in local papers, has not been noticed in the *Record*. Here a rod, 21½ inches long, was found in the stomach and had caused an abscess which discharged externally, the illness lasting several months.

We do not seem to have advanced as far as we might in the diagnosis of these conditions in valuable animals. Exploration of the rumen seems always called for in cattle in abdominal cases of indefinite origin and in which the tuberculin test is negative. Frequent bouts of grunting, whether the stomach is full or otherwise, may be associated with a foreign body, especially if there is a disinclination to move on the part of the animal. We are so accustomed to find cardiac disability in connection with foreign bodies in cattle that we possibly neglect, or under-estimate, the probabilities of their travelling in other directions, or becoming anchored in the stomach, and thus they remain unsuspected until revealed by *post-mortem* examination. When may we expect a practicable and portable X-ray apparatus?

Traumatic Hernia in Dogs and Cats.

Recovery without a Surgical Operation.

By Henry Gray, M.R.C.V.S.

Traumatic hernia is frequently seen nowadays, arising from dogs running under motor-cars and being struck by projections or by falling out of windows on to railings; in cats, by being crushed by slow-moving cars in garages or in falling out of windows and striking some prominence in their descent. In dogs there has been no damage done to the skin, but there has been a wide rent in the abdominal walls, allowing the viscera to escape under the skin, and in large dogs forming a swelling as prominent as a man's bowler hat. In smaller dogs, the swelling has been as large as a cocoanut. These herniæ may occur anywhere in the abdominal walls, but from crushes from motor-cars in the inguinal region both in the dog and cat.

Where no vital damage has been done to the internal viscera or to the bony framework, especially that of the pelvis, reduction may be made by manipulation, and maintained by keeping the animal quiet and feeding only on milk, to reduce the intra-abdominal pressure.

If the prolapse or escape of bowel from the abdominal cavity should recur, it should be replaced. As a general rule, the ventral rent becomes closed up, and the viscera are permanently retained in the abdominal cavity within a week without any surgical operation or bandaging.

The moral is: Why operate when one can obtain such successful results as I have depicted above? The essentials are: to keep the animal perfectly quiet (in which he usually acquiesces); to reduce the intra-abdominal pressure by not giving solids or stimulating food, and to replace the bowel within the abdominal cavity, and wait patiently until the ventral rent has had time to disappear.

Artificial Feeding of Horses and Mules.*

By Captain Everett C. Conant.

About two years ago I had occasion to treat a case of pneumonia in an extremely valuable mount. The owner was particularly fond of the animal and was willing to do anything in his power to aid in the treatment. This horse, from the onset of the disease, persisted in refusing to touch every kind of food. He was treated in the early fall, and large amounts of green forage were available, but even this material did not tempt him and he continued his indifference to all foods even in the most appetising forms. I know of nothing more discouraging in the treatment

* Reprinted from U.S. Army Veterinary Corps *Bulletin*, Feb., 1926.

of animals than to get the report from the ward-master that the patient continues to neglect his food, or, in observing the individual case ourselves, to find a complete loss of appetite on the part of the animal. In such cases we feel free to expect an unfavourable outcome. Naturally, in the case in question my mind turned to the subject of artificial feeding as a last resort, in order to assure the owner that we had done everything possible toward assisting his mount to regain its normal health.

I have attempted rectal feeding in animals, but never with what might be regarded as successful results. For that reason I was inclined to disregard this method and seek something different. It occurred to me that the most logical method of artificial feeding would be through the use of the stomach tube, an instrument which we use practically every day at this station and in a variety of ways. We decided to experiment with the tube in this case. Our next step, therefore, was to determine the kind of food which would probably be the most desirable. A mixture of oatmeal, eggs and alcohol was prepared and fed twice daily for a period of a week with remarkable results. This may not be a particularly good diet for the horse, but we all feel that it was the means of bringing this animal through to a prompt recovery. It seemed to be exceedingly beneficial in preserving the strength of the animal and we decided to continue its use in other cases. Cornmeal can be used, but it is not quite so easily pumped into the stomach. A number of other cereals was tried but none gave such favourable results as the oatmeal. This method of feeding has been followed with excellent results for the past two years at this hospital. Having used the material for such a long period, our method of preparation has been perfected somewhat so that the task of feeding has now become a simple one.

Our method is to take from one to two pounds of oatmeal and cook it thoroughly for at least an hour, depending to a large degree upon the brand of product, the object being to have it approach a gelatinous mass as closely as possible. The cooked product is placed in the bottom of a two and one-half gallon, white enamel, bucket, one dozen raw eggs are added and the mixture thoroughly stirred. To this are added from two to six ounces of ethyl alcohol and the bucket is filled with water. The temperature should be such that the hand and wrist can be immersed in the mixture without discomfort. The contents being thoroughly stirred, the pump may be placed in the bucket after the stomach tube has been passed (preferably through the nostril) and the fluid injected directly into the animal's stomach. If the oatmeal is not cooked sufficiently, a gummy sediment will form at the bottom of the bucket and obstruct the pump. This ill-effect can be corrected, if there is not time to cook the oatmeal properly, by continued stirring or by placing a small tin receptacle (a saddle soap tin is usually effective) in the bottom of the bucket after the mixture has settled and pump from it instead of from the bottom of the bucket. In this way all the fluid will pass into the animal's stomach readily and, on reaching the bottom of the mixture, the sediment remaining after the tin has been removed will pass through the tube readily. We usually practice pumping about one quart of warm water into the stomach after all the mixture has been pumped out of the bucket, in order to insure all of the mixture reaching the stomach and not being left in the tube.

Ordinarily, we content ourselves with one feeding a day, but in severe cases we give two. In addition, suitable medicines are sometimes added, depending upon the individual case. The quantity of food given is gauged entirely by the condition of the animal concerned. The mixture, as outlined, is sometimes given with as high a content as two dozen eggs.

We recommend this method highly from the *data* obtained during the past two years. It has given excellent results, and while it is only an aid to proper therapeutic measures, it is a valuable one. I might add that this has been a great boon to us during the last month in treating a large number of especially virulent influenza cases.

We find that owners of private mounts are glad to supply the oatmeal and eggs, that organisation commanders approve the expenditure from company funds for the procurement of these products for public animals, and that the organisation messes are only too glad to cook the cereal.

ANATOMICAL NOTE.

Abnormal Sexual Organs.

By F. H. Manley, B.V.Sc., M.R.C.V.S.,
Veterinary Research Department, Uganda, British East Africa.

Subject. Wild rat.

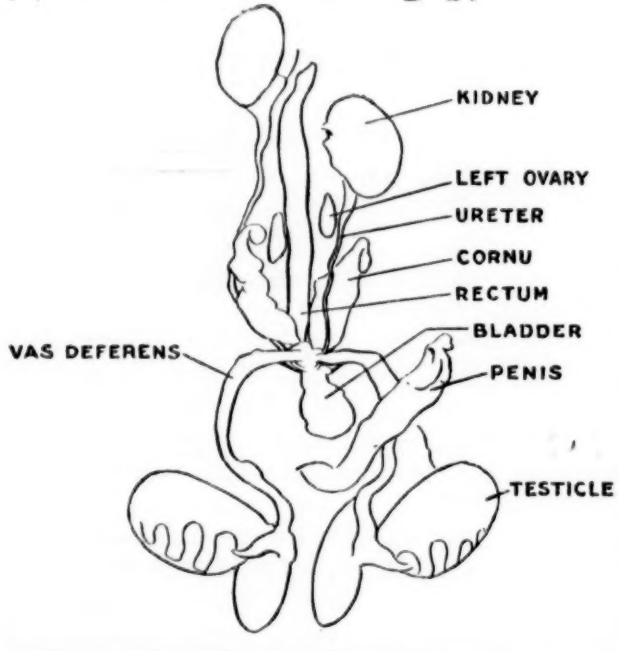
This animal was caught in the vicinity of the Laboratory, and at the time of death was being used for experimental work on *T. Congolense.*

The external genital organs appeared to be normal, with the exception, perhaps, of the rather large-sized testicles.

On opening the abdomen, the abnormal development of the internal genital organs was noticed. The male organs were complete. The female organs were represented by two ovaries, slightly posterior to the kidneys, and two uterine cornua.

The part which is normally the continuation of the urethra into the bladder presented a slightly swollen pouch-like appearance. Into this pouch the two cornua opened anteriorly, the spermatic ducts intralaterally, and the ureters and bladder inferiorly.

The accompanying photograph and sketch more clearly illustrate the arrangement of the organs.



ARMY VETERINARY SERVICE.

LONDON GAZETTE—WAR OFFICE—REGULAR FORCES.

September 14th: The follg. to be Lts. (on prob.) (Sept. 15):—A. G. Heveningham, C. U. K. Porter, I. D. Macrae, A. G. Ralston.

TERRITORIAL ARMY—RESERVE OF OFFICERS.

Maj. F. W. C. Drinkwater, from Active List, to be Maj. (Sept. 15); Capt. H. B. Collet, from Active List, to be Capt. (Sept. 15).

TRANSLATION.

Contributions to the Study of Movements in the Isolated Intestine.—*Continued.*

By J. KOLDA.

Article II.

The Influence of Poisons of the Nervous System on the Isolated Intestine of the Horse.

The influence of those poisons has been studied by means of the method described in the preceding article. Among the vagotonic substances we have chosen arecoline, eserine and pilocarpine. We have also studied the action of atropine scopalamine and hyoscyamine. Solutions of the salts of those alkaloids have always been employed fresh; they have not been added to preparations (intestine) except when the movements were normal and regular for five minutes and the tonus maintained itself at the same height. As a result, we have ascertained the following facts:—

1. The vagotonics studied always show, after addition to the enclosing liquid, elevation of the tonus of the intestine of the horse, and this increased with the dose employed. For pilocarpine those observations are only worth noting if the preparation (intestine) is fresh. If pilocarpine is added to the preparation (intestine) which presents movements for a certain time (fatigued or exhausted preparation, intestines) it can produce a lowering of the tonus. Eserine sometimes shows itself without any action in the solution, in other preparations (intestines) it has increased the tonus. Arecoline always shows an increase of the tonus.

2. The rhythmic movements are always paralysed by all the three poisons if they are employed in large doses. This paralysing action acts indirectly, having for its cause a direct exciting action on the tonus; in short, large doses of those poisons cause such an increase of the tonus that all movements become impossible and the action of the intestine is arrested in tetanic systole. After the addition of small doses when the increase of the tonus is only slight, one can, on the contrary, observe an exciting action on the movements—their fulness becomes deeper and sometimes they quicken. In addition to this direct exciting action on the movements, it is necessary to distinguish a similar but indirect action which is produced through the intermediary of the tonus. If, in effect, the tonus has been artificially relaxed in such manner that the movements have been weakened or arrested in complete atony, the vagotonics in a suitable dose raise the tonus to its utmost value, the movements reappear and become more marked.

3. From the point of view of their exciting action *on the tonus*, one can say that arecoline is more active than pilocarpine and this more active than eserine. In comparing their individual exciting action *on the movements*, one can say that eserine is more active than pilocarpine and the latter more active than arecoline.

4. The alkaloids act on the tonus through the agency of the para-sympathetic, and on the motility very probably through the agency of the local meta-sympathetic.

5. Atropine, hyoscyamine and scopalamine invariably slacken the tonus. That is observed especially on the preparations (intestine) of which the tonus has previously been activated by one of the aforementioned vagotonics. This action is more pronounced in the presence of atropine.

6. In large doses the three alkaloids of the atropine group paralyse the rhythmic movements through the agency of the tonus, which they depress to such an extent that the movements in the intestine are arrested, due to atony, in a state of complete "diastole." Small doses have, on the contrary, an exciting action on the rhythmic movements, which, under their influence, become more marked, increased and regular.

7. The lowering of the tonus is determined by the action of atropine on the parasympathetic. Those poisons act, very probably, on the movements through the agency of the local metasympathetic; one also remarks on their exciting action on the movements, especially in preparations (intestines) of which the parasympathetic is not hyperexcited, or, better still, if it has been previously weakened or exhausted. From this point of view our results are in full accord with those of Warmoes[1] who, experimenting on the intestine of the rabbit, increased the excitability of the metasympathetic by adrenaline, but we have never observed on the intestine of the horse the increase of the effects of eserine by atropine as Haenens[2] describes it for the isolated intestine of the rabbit.

The results of our experiences permit an explanation of certain differences which persist concerning the action of atropine; why it acts sometimes as a "depressant," at other times as an "excitant." Although the rhythmic movements may be in very direct relation with the tonus, it is, nevertheless, necessary to distinguish carefully the action of the different substances on the rhythmic movements and on the tonus. The vagotonics studied have an exciting action at the time on the tonus and the rhythmic movements. The alkaloids of the atropine group have a depressant action on the tonus and at the same time an excitant action on the rhythmic movements. This latter manifests itself every time that the former, for some diverse reason, does not appear. This takes place specially when the parasympathetic is exhausted. The practising veterinarian utilises not only the depressant action of atropine on the tonus in cases of spasmodic colic, but also its excitant action on the intestinal contractions in cases of "stasis" accompanied by atony. Rogers[3], Laboratoire du Pr. O. Rybak de l'Ecole Vétérinaire.

Per Comptes Rendus des Séances de la Societé de Biologie.—T. D. Y.

[1] Warmoes: *Arch. Internal. de Pharm. et de Thérap.*, 1925, t. xxx. p. 194.
[2] D'Haenens: Idem, 1925, t. xxx. p. 77.
[3] Rogers: *Les Coligues du Cheval, Paris*, 1921.

DIVISIONAL REPORT.

The North of Ireland Division.

A meeting of the above Division was held in the Royal Hotel, The Giant's Gauseway, Portrush, on Saturday, 21st August, 1926, at 4 p.m.

The President, Mr. J. Ewing Johnston, M.B.E., occupied the Chair, and the following members were present: Messrs. Johnston, Kyle, Finch, Kernohan, Orr, J. I. Magowan, King, Wm. S. Lamont, Gault, Monro, and H. G. Lamont (Hon. Secretary). *Visitors:* Messrs. Gordon, Kyle, jun., and F. Kane.

Apologies for non-attendance were received from: Messrs. F. W. Emery, J. McLean, A. McLean, George Wilson, H. C. I. Kelly, W. Smith (Newry); H. L. McConnell (Belfast), H. McConnell (Armagh), and W. F. McConnell (Strabane).

The minutes of the previous meeting having been read and signed as correct, the President called on the Secretary to read the correspondence.

A letter from Captain J. P. Rice in reply to a letter from the Council requesting him to reconsider his decision to resign from the Division was read. For the benefit of the members, the Secretary explained that after the meeting of March 9th, Captain Rice had sent in his resignation on the 19th March with the request that it be drawn to the notice of the members at the next meeting. The next intended meeting, however, had been interfered with by the General Strike. In the meantime, his proposed resignation was considered by a Council Meeting on the 7th July, 1926. As Captain Rice's letter specified no reason for his proposed resignation, it was considered by the Council that perhaps he had acted hastily and the Secretary was instructed to write and intimate to him that it was the unanimous wish of the Council that he should reconsider his decision. In reply to this letter the letter now read was received:—

"Dear Sir,

"I am obliged for your letter of the 16th instant acquainting me with a unanimous decision of the Council of the Association that I should be requested to reconsider my decision to resign from the Association.

"Ordinarily it is not desirable that a junior member, such as I am, should criticise the administration or the activities of the Association, but the request of the Council makes it necessary that I should do so.

"The Council will agree with me that the Association was founded to advance the interests of and to unify the veterinary profession, especially in Northern Ireland. I think, as do most veterinarians in Ulster, that during recent years the Association has singularly failed in these objects. One has only to examine the record of the Association since, say, 1920, with reference to the attendance and discussion at meetings, to the number of professional papers read, and to the improvements effected by the Association in the number and value of the appointments held by local practitioners, to realise how great has been the failure. In my view there is unity of neither purpose nor action amongst the members.

"The Association is without influence because it is only too well known that it is not a representative body. A prominent veterinarian told me that he classed the active members as those who had almost given up hope that the Association would function according to the rules and to the objects of the founders, and those who hoped it would never so function because they would lose the means of deriving personal advantages.

"I wish to assure the Council that I make the above criticism in no spirit of personal antagonism. I humbly define what appears to me to be the present state of the Association in the hope that it will be re-organised into a live body which will advance the cause of veterinary surgery.

"With the permission of your Council, I shall postpone decision regarding my resignation till after the next meeting of the Association when the officers then elected may have plans justifying the belief that by continuing my membership I can do good to and receive good from my brother veterinarians through the Association.

"Yours faithfully,

J. P. RICE."

"The Honorary Secretary,
North of Ireland Veterinary Medical Association."

The members present considered Captain Rice's letter to be in bad taste and unworthy of a member of the Division. It was unanimously decided to refuse him permission to postpone decision regarding his resignation until after the next General Meeting. It was the unanimous opinion of the meeting that his letter be marked "read" and his resignation accepted. The Honorary Secretary was instructed to convey this intimation to Captain Rice.

The Secretary then read a telegram of sympathy which had been sent by the President on behalf of the Division to Lady Stockman on the death of her beloved husband, and Lady Stockman's reply. The members present expressed their indebtedness to Mr. Johnston for his action in this matter, universal sympathy being felt for Lady Stockman in her great loss.

A letter from the Acting Chief Veterinary Officer was also read, intimating that he and his colleagues had been much touched by Mr. Johnston's telegram.

Mr. TALLENTS' DEPARTURE.

The Secretary read the following resolution which had been passed at an emergency meeting with reference to the departure of Mr. S. G. Tallents, C.B., C.B.E., Imperial Secretary to the Governor of Northern Ireland:—

"That this Association has learned with much regret of the impending departure from Northern Ireland of Mr. S. G. Tallents, C.B., C.B.E., Imperial Secretary to the Governor of Northern Ireland. We desire to place on record our deep appreciation of the able manner in which he has administered the reserved services, which included the veterinary department. We feel under a deep indebtedness to Mr. Tallents for the warm-hearted and able way in which he has supported veterinary science, and for the sympathetic and courteous manner in which he has at all times met the members of our profession. We wish him health and happiness in the future, which we are sure will be full of brilliant achievements."

Mr. Tallents' reply was read:—

"I have been most anxious during the short period of my administration of the Diseases of Animals Acts in Northern Ireland to maintain relations of confidence between the veterinary profession and this Department. So far as that maintenance has depended on this Department, it is due to Mr. Emery rather than to myself. But both of us gratefully recognise that the chief contributors to it have been the veterinary surgeons of Northern Ireland, to whose unfailing helpfulness and courtesy I am happy to take this occasion of bearing witness.

"I therefore desire to express to the Association my hearty thanks for its kind words and wishes. The friendly relations which have been maintained between us have done much to make my stay in Northern Ireland a very happy time."

The members present warmly approved of the action of the Emergency Meeting.

The extraordinary omission of the veterinary profession from the exemption list in the Juries Amendment Act was considered. It was proposed by Mr. W. S. LAMONT, and seconded by Mr. J. KERNOHAN, that this matter be left in the hands of the President.

It was decided to send a resolution of congratulation to Bangor Urban Council on their decision to build a public abattoir and expressing the hope that the system of meat inspection would be entrusted to fully qualified veterinary surgeons.

Mr. ORR raised the question of members signing tuberculin test certificates and omitting to add their qualification. It was resolved that in future members of the profession add the letters M.R.C.V.S. after their names for the benefit of Secretaries of Shows, Sales, etc., so that these may know that the certificates had been signed by fully-qualified veterinary surgeons, who alone were authorised to do this. It was decided to convey this information to people interested.

On the proposition of Mr. GAULT, seconded by Mr. W. S. LAMONT, Mr. Arthur G. Gordon, Magherafelt, was elected a member of the Division.

Professor Symmers, Dean of the Faculty of Medicine, Queen's University, then delivered an address on "The Relationship between the Veterinary and Medical Professions." This was listened to with great interest and enjoyment. Professor Symmers prefaced his address with the remark that both professions were branches of the science of alleviating disease—the doctor studying human ailments and the veterinary surgeon animal ailments. Professor Symmers dealt with his subject in a masterly manner and it is to be regretted that the shorthand writer arranged for failed to appear, so that a permanent and correct record of his address is lost; however, one

remark of his will remain in the memories of those who were privileged to hear this old friend of our profession, *viz.*, " the veterinary surgeon is alone fitted by his training and knowledge of animal pathology to supervise the production of a clean milk and a wholesome meat supply."

Professor Symmers, on completing his address, was enthusiastically acclaimed by his hearers.

The discussion was opened by Mr. Johnston, and participated in by Messrs. Kernohan, W. S. Lamont, Orr, and Finch.

Inter alia Mr. ORR expressed the opinion that the Ministry of Agriculture, Northern Ireland, should be asked to send its exhibition of clean milk production throughout the country in order to educate the farmer in this important matter.

A cordial vote of thanks to Professor Symmers terminated the proceedings.

The members present and their ladies were then entertained to tea by the President, to whom the best thanks of the Association are due. Unfortunately, Mr. Johnston left before the members had an opportunity of intimating their thanks to him.

H. L. MCCONNELL,
H. G. LAMONT,
Joint Hon. Secretaries.

Gapeworm in Chickens.

" New light has," says the scientific correspondent of *The Times*, " been shed on the disease known as ' gapes ' in chickens, throwing more than suspicion on the starling as an important agent in the maintenance of the disease and so suggesting a possibility of control. The affliction gets its name from the fact that the chief symptom is a gasping for breath, as if the windpipe of the affected birds were actually blocked. It has been known in this country for more than a century. Adult birds sometimes recover even without treatment, but the chickens on a farm or the young pheasants on an estate in any spring may be almost wholly exterminated. There may be years of quiescence and then sudden outbreaks in epidemic form.

" The cause is a parasitic round worm, known as *Syngamus trachealis*, easy to recognise because in the adult stage the male is permanently affixed crossways to the body of the female by a secretion of the prostatic gland, so that the couple present the appearance of an ' X.' The adults are present only in the windpipe of the bird, the female being up to three-quarters of an inch in length, the male rather shorter. The female produces large quantities of eggs which pass from the windpipe into the stomach of the chicken, although a few may be coughed out, and are then extruded with the droppings. Under suitable conditions of which the most important is a temperature not lower than about 77deg. Fahr., the eggs hatch. If the embryos get into the alimentary tract of a chicken, they find their way through the walls of the gut into the blood stream, and carried in that, reach the alveoli of the lungs. There they grow rapidly, moult twice, and become sexually adult. The males and females adhere in pairs and migrate into the trachea, where they rapidly become adult and give rise to the symptoms of the disease.

" The details of this life-history have been worked out by several observers, of which the most recent and complete was Dr. Ortlepp, one of the research workers at the London School of Tropical Medicine, working under the general direction of Professor Leiper. But there are alternative routes from an infected chick to a new victim, and there is still difference of opinion as to the relative importance of these. In all probability the least frequent occurrence is for a chick to swallow a mature worm that has been coughed up by another, and for the liberation and ripening of the eggs to take place within the alimentary canal. A method, shown to be possible by Dr. Ortlepp and which must not infrequently happen in nature especially during warm and wet weather, is for the eggs to pass into water with the droppings of infected birds, to hatch in the water, and to reach another bird when it drinks. A third mode, probably rare in well-kept artificial runs with hard floors, but extremely frequent in grass runs and where fowls or young pheasants wander freely, is for the eggs to be swallowed by earthworms and to hatch in their bodies, reaching the chickens when they eat the infected worms.

WINTER QUARTERS OF GAPES.

" In autumn and winter, few, if any, domestic fowls suffer from gapes, and yet each spring when chicks hatch out there may be a serious epidemic of the disease. Where and in what form do the gape worms survive the winter ? The earthworm may be dismissed, as it is extremely improbable that either the eggs or the embryos could survive for the necessary number of months, and as no evidence has been obtained in support of the supposition. Ransom, an American worker, has shown that in the United States the turkey is an important agent. Full-grown turkeys harbour gape-worms without being killed by them ; they are what is known as tolerant ' carriers ' of the plague. Turkey hens on a farm would therefore form a permanent reservoir of the parasite and be able to infect young chickens when they hatched out in spring. Sir Arthur Shipley believes that the turkey is an important agent in this country, and Professor Leiper and his assistants have found gape-worm in the windpipes of a considerable percentage of turkeys killed for the London market.

" But epidemics of gapes occur in many places where no turkeys are kept, and there must be some other means of winter survival. Mr. E.A. Lewis, of the University College of Wales, recently examined the wild birds of the Aberystwyth area for parasites. His results, published in the *Journal of Helminthology* for March, showed the presence of the gape-worm in starlings. Professor Leiper encouraged him to pursue his investigations, and he found that 35 per cent. of 482 starlings killed during the months of November to February last winter were infected with gape-worm. Since then 18 starlings killed during Eastertide near St. Albans were examined in Professor Leiper's department, and four were found to be infected. In the starling, as in the turkey, only one or two worms were usually found in each bird, so that they did not die from gapes.

"The gape-worm has been found in wild birds, notably in the thrush, by several investigators, but no infection on the scale discovered in the starling has yet been made known. In three-quarters of a century the starling has materially increased its range in Great Britain. Large flocks arrive on the east coasts in autumn, and the permanent residents usually migrate westwards in the same season. In a paper contributed to the *Journal of Helminthology* for May, Mr. Lewis discusses the relation of the incidence of gapes in fowls to the migrations of starlings, and makes out a very strong case. The gape-worm of the starling, however, has been described as a distinct species. At a scientific meeting of the Zoological Society last week, Professor Leiper said that his department had infected chickens with eggs taken from the starling under carefully controlled conditions, with the result that heavy infection with gapes was produced. The indictment of the starling, therefore, seems complete."

British Horses for U.S.A.

A correspondent to *The Times* of September 14th says:

"At a time when the pessimist is busy in many places prophesying evil about the future of the horse, a development of the foreign trade in horses is taking place which may in time revolutionise the position of horse-breeding. America, as is well known, has been one of our best customers for horses ever since 'Frank Forester,' a kinsman of the famous Earl of Egremont, settled in the United States and devoted his energies to the history and development of the thoroughbred in America. As well as the thoroughbred, Shire horses, Clydesdales, Suffolks, Cleveland Bays, Yorkshire Coach horses, Hackneys, and other breeds have their enthusiastic admirers across the sea.

"Some years ago there were signs of an increased interest in horses in America. Men were beginning to realise that the life which so many of them were leading tended to the loss of health, and riding clubs came into being. From time to time visitors to this country looked out for a hunter that was a good 'ride' on the roads, and every now and then a horse disappeared from the English show rings to cross the sea.

"Recently there has been an important purchase of hunters for the United States. Mr. W. H. Lee, the buyer for McNair's, of Chicago (which was one of the first places where the American revival of riding was seen), made a tour round Yorkshire under the guidance of Mr. James Ellis, of Dringhouses, who is well known in the horse world in the North. During his tour with Mr. Ellis, Mr. Lee bought fifteen high-class hunters. From the names of the vendors one may readily form an idea of the quality and character of the horses that have been purchased, and the fact that Mr. Lee has stated that it is his intention to visit England again early in the spring suggests a prospect of a stable trade in horses of the hunter type developing. It is certain that others will soon begin to look round if Mr. Lee's enterprise meets with sufficient encouragement, as it is almost sure to do.

"The horses for this market must have undergone a certain amount of training."

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

Sept. 25th. Meeting of the Scottish Branch, at Perth.

" Meeting of the North of England Division at Newcastle-on-Tyne.

Sept. 30th. Autumn meeting of the Eastern Counties Division at Norwich.

Oct. 6th. N.V.M.A. Council and Committee Meetings.

Oct. 7th. R.C.V.S. Committee Meetings.

Oct. 8th. R.C.V.S. Council Meeting.

Oct. 14th. Annual General Meeting of the Central Division at 10 Red Lion Square, W.C.

Belfast Jurors' Revision.

Veterinary Surgeons Exempt.

"His Honour Judge Begley, K.C., opened the Sessions for the revision of the jurors' lists for the City of Belfast at the County Courthouse, Belfast, to-day," says *The Belfast Telegraph* of September 16th. "His Honour having disposed of a number of applications for exemptions, Mr. J. A. Culbert, solicitor, representing the North of Ireland Veterinary Medical Association, applied to his Honour for a ruling in the case of Mr. J. Ewing Johnston, M.R.C.V.S., May Street, that registered veterinary surgeons were entitled to exemption from service pursuant to the decision in the case of Charles Allen, decided by the Court for Crown Cases Reserved in 1903. The Juries Act, 1876, exempted licensed medical practitioners, and the Court held that veterinary surgeons were entitled to the benefit of this exemption. Under the Northern Ireland Jury Laws Amendment Act, 1926, it is provided that registered medical practitioners shall be exempted.

"His Honour stated that he would follow the decision in Allen's case and exempt Mr. Johnston. The decision would entitle registered veterinary surgeons to be exempted."

Foot-and-Mouth Disease.

"Few even among those who by close experience know more about foot-and-mouth disease than the ordinary layman could have realised that the Carluke outbreak would have continued so long," says *The Scotsman*, of 10th September. "It was confidently expected by many that the country would have been free of the disease long before the important sheep sales held this week. The serious development in recent weeks has shown that that was a far too hopeful view, and the spread of the disease has had the unfortunate effect of postponing the Lanark sale of pedigree sheep, in which so many interests are in-

volved. This feeling of hopefulness was no doubt encouraged in some quarters by the impression that sunheat and sunlight have prophylactic properties in relation to the disease, so that when the days lengthened and the sun asserted its powers the scourge would lose its grip. Experience has not served to support the view that the infection is thus ready to surrender to benign solar influences. We are still confronted with the possibility of fresh outbreaks, no owner of stock knowing from day to day whether he will be the next victim; or, at any rate, find himself in an area where the foot-and-mouth disorder has broken out. Credit must be given to the Ministry of Agriculture for steadfastly adhering to the method of combating the disease which alone can avail to keep disease in check in the light of present knowledge. Foot-and-mouth is such an insidious disease that measures of control should not be left entirely to officials. It is the plain and imperative duty of stock-owners and all concerned in the live stock industry in the affected area to observe scrupulously the rules and regulations of the Ministry and to report immediately the slightest suspicion of disease. Infected places should be regarded as places not to be visited, because experience has shown that the human agency is one of the chief factors in the spread of the disease. It is, of course, difficult to control the movements of the public, but in the national interest the public should take heed of the oft-repeated warnings against crossing fields which are in the danger zone."

. . . . . .

Foot-and-mouth disease has broken out in several parts of Belgium, and numerous fairs and cattle markets have had to be suspended, including the big fair which was due to take place at Forest in October. More animals were infected during the first half of August than during the latter half of July, 621 communes having reported 3,126 sources of infection, involving 30,000 cattle, 13,200 pigs, 1,135 sheep, and 160 goats. The Department of Agriculture is taking measures to prevent the outbreak spreading.—*The Times.*

Personal.

Will:—Mr. John Alexander Hodgman, of Shambles Street, Barnsley, veterinary surgeon, who died on July 19, aged 64, left estate of the gross value of £9,536, with net personalty £1,547. He left:—

Five houses in Gawber Road, Barnsley, to Benjamin E. Cross, should he survive the testator for 12 months, but should he die in that period then he gives the five houses to the Beckett Hospital and Dispensary, Barnsley.

£1,000 to the Beckett Hospital and Dispensary to endow a bed, and £100 to the National Children's Homes, City Road. London.

Cotton Cake and Anthrax.

At a meeting of the Perthshire Executive Committee, under the Disease of Animals Acts, at Perth on September 10th, Chief-Constable M. T. Martin stated that during the past six months two cases of sheep scab had been reported, and both confirmed; 33 cases of swine fever had been reported, and none confirmed; 35 cases of tuberculosis had been reported; and 60 cases of anthrax had been notified. In six of the 35 confirmed cases more than one animal died, and as many as eight in one herd. The increase in anthrax was reflected in the fact that veterinary inspections cost £231 odd, as against £24 for the previous six months, while £96 6s. 9d. was expended on treatment, as against £35. The Chairman thought the Ministry of Agriculture should find some process through which to put cotton cake to prevent infection. He attributed to that cake most of the trouble.—*Edinburgh Evening News.*

Blood Tests for Poultry Diseases.

Although the Ministry of Agriculture carries out *post-mortem* examinations of poultry, agglutination tests for bacillary white diarrhœa and other bacteriological work in connection with poultry at its veterinary laboratory, it has been found impossible for the present to undertake the work of applying the agglutination test to any considerable number of birds from flocks in which the disease has not been diagnosed already. The Ministry points out that the agglutination test is only desirable for the detection of carriers of bacillary white diarrhœa among breeding stock, and it is inadvisable and unprofitable to apply it for the elimination of infection from among chickens which have survived an outbreak. Particulars as to fees and the dispatch of birds and blood samples may be obtained from the Veterinary Laboratory, New Haw, Weybridge, Surrey.

Motor Laboratory for the A.D.R.A.

The Animal Diseases Research Association of Scotland has received intimation that their president, Mr. Falconer L. Wallace, of Candacraig and Belcairn, is to present the Association with a motor laboratory.

This handsome gift, which will consist of a motor-lorry chassis fitted with a specially-designed body equipped as a laboratory, will enable the trained staff of the Association to tour the country districts with scientific apparatus ready at hand suitable for making investigation anywhere.

The lack of such a mobile laboratory has been felt in the past, as it is so essential that a great deal of the investigation on the diseases of animals should be carried out on the spot.

This motor laboratory will complete the very fine equipment with which the Association is being provided at its Institute at Moredun, Gilmerton, and in the laboratories which have been fitted up for it at the Royal (Dick) Veterinary College.

The thanks of all those interested are due to Mr. F. L. Wallace for his munificent gift.—*Aberdeen Evening Express.*

The Ceremony of laying the Foundation Stone of the Chapel of Ellesmere College, Shropshire, which is being erected as a Memorial to old Ellesmerians, will take place on Thursday, September 29th, and not September 30th as previously announced.

Full details of the Ceremony can be obtained from, and contributions to the Memorial Fund may be made to The Secretary, Ellesmere College, Shropshire.

All old boys and their friends are welcome.

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.
All correspondence must bear the name and address of the contributor for publication.
The Editor does not hold himself responsible for the opinions of his correspondents.

Scottish Part-time Inspectors and Part-time Inspectors in General and the Dairies Acts and Orders.

To the Editor of The Veterinary Record.

Sir,—It is interesting to note, in consideration of the matter in reference to the above, Section 3 (2) of the Milk and Dairies (Scotland) Act, 1914 : " A Veterinary Inspector so appointed shall not engage in private practice in any district in which he holds office save with the consent of the Board ; and the Milk and Dairies (Consolidation) Act, 1915 of England Section 10 (1) : " A local authority may, and when required by the Local Government Board shall, appoint or combine with another local authority in appointing one or more veterinary inspectors or employ for the purposes of this Act and the Milk and Dairies Orders any Veterinary Inspector appointed under the Diseases of Animals Act, 1894."

It is evident that the Scottish Section is more stringent and drafted by those who thought that good work could only be done by whole-time men (but with a saving clause) apparently regardless of expense or any other consideration. One is inclined to ask, was the veterinary profession, whose co-operation is necessary in the operation of these measures, consulted ? Personally, I do not think so, as it is generally recognised in the profession, whether by whole-time or part-time members, that for the efficient working of these measures, the part-time inspector is required.

The condition that the part-time man should not engage in private practice in any district in which he holds office is, in my opinion, grossly insulting and very impracticable.

In my view, any man who accepts the condition is degrading the status of the profession, and I believe there are some on this side of the border, with less reason than others, who have accepted the condition.

It is time we put our house in order.

I may say that the Veterinary Inspectors in this district have been asked to consider the carrying out of these duties, and the only question on which there is likely to be any difficulty is the question of fees. The question of honourable performance of our obligations has not arisen, nor do I think it is likely to arise and, if it did, would be treated by the Veterinary Inspectors of this district as contemptible.

Our position is good, but I shall have no difficulty in bringing up before the Division, of which I am a member, the position of others, which is intolerable.

This is a matter which, it seems to me, could be taken up divisionally by any Division now meeting, whilst those who have a Branch Meeting in their district are even more fortunate.

Surely the Veterinary Inspectors can come together and keep together and hang together for once on a matter of honour and justice.—Yours faithfully, Hugh P. Hogben.

26 Manor Road,
Folkestone.
20th *September*, 1926.

The Encystment of Cercariæ.

To the Editor of The Veterinary Record.

Sir,—May I crave a small portion of your space to comment upon one matter raised during the discussion on Mr. Norris' paper, " The Control of Liver Fluke in Sheep and Cattle " ?

In opening that discussion I said, " A percentage (of cercariæ), perhaps as small as six, encyst on the surface of the water." The Chairman, Professor Craig, closing the discussion, commented, " With regard to the cercaria encysting on the surface of the water, it could not be said that the cercaria cysts were deposited on the water. It was more probable that they were washed off the grass and carried away by water which flowed over it." Mr. Norris, in his reply, indicated that he hesitated in accepting the statement which I had made and believed they were washed off.

According to Daubney's abstract (*Jnl. Comp. Path. and Ther.*, Vol. xxxiii., p. 221) of Sinitsin's article (1914), the latter referred to Domontowitsch's observation that 6 per cent. of all cercariæ encysted while floating free on the surface of the water. This free encystment has been observed in the laboratory here. It would appear possible that under certain field conditions cercariæ might experience greater difficulty in finding a site for encystment, other than the surface of the water, and that the percentage encysting free would be larger than that stated above.

It may be that whether cercariæ carried by water originally encysted free or attached is of little practical importance. I have, however, been struck by the firmness of the degree of fixation which attached encysted cercariæ exhibit and hope to make some observation on the effect of running water upon it.

I write now that Professor Craig, Mr. Norris and others interested may know the basis of my statement and reconsider, if they think worth while, their acceptance of it.

I am, yours faithfully, R. F. Montgomerie.

Department of Agriculture,
University College of North Wales,
Bangor.
16*th September*. 1926.

The Editor acknowledges the receipt of the following :—

Communications from Captain H. Kirk, Miss D. Knight, Mr. W. J. Leyshon, Major-General Sir John Moore and Mr. Walter Scott.

Report of the Civil Veterinary Department, Assam, for the year 1926.

National Veterinary Medical Association of Great Britain and Ireland.

EDITORIAL OFFICE : 10 Cray's Inn Square, London W.C.1.

All communications relative to the literary side of the Veterinary Record must be addressed to the Assistant Editor, " Veterinary Record," 10 Gray's Inn Square, W.C.1